ARGUMENTS/REMARKS

Applicants have amended Claims 1-2, 4-6, 12-13, 15, 17-18, 20 and 22 and have cancelled Claims 3, 10, 19 and 21. No new matter was added by these amendments. Claims 1-2, 4-9, 11-18, 20 and 22 remain in this application. Applicants request reconsideration of this application in light of the above amendments and these remarks and arguments.

The Examiner has rejected: Claims 1, 2, 4-6, 8-11, 18, 19 and 20 under 35 U.S.C. 102(b) as being clearly anticipated by (USPN 5,287,556) by Cahill; Claims 7 and 12 under 35 U.S.C. 103(a) as being unpatentable over Cahill, as applied to claim 1 above, and further in view of (USPN 5,467,055) by Wray, et al., hereinafter Wray, and Claims 13-17 and 22 under 35 U.S.C. 103(a) as being unpatentable over Wray in view of Cahill. Applicants have cancelled Claims 10 and 19, thereby, rendering moot the Examiner's rejection of these claims. Applicants traverse the remaining rejections.

Embodiments of the present invention include a device that generates a variable output signal, which includes a feedback loop for adjusting the variable output signal. As recited in Claims 1 and 20, the feedback loop has an input for receiving an input signal, an output for outputting the variable output signal and a loop bandwidth associated with a forward path and a feedback path of the feedback loop, and the feedback loop comprises: a power amplifier coupled to the output of the feedback loop in the forward path of the feedback loop; at least one adjustable zero element coupled between the input of the feedback loop and the power amplifier; and at least one adjustable pole element coupled between the input of the feedback loop and the power amplifier, wherein the at least one adjustable zero element and at least one adjustable pole element are operable to change the loop bandwidth of the feedback loop. Claim 20 further recites a first mixer in the forward path of the feedback loop coupled between the input of the feedback loop and the power amplifier; and a second mixer in the feedback path of the feedback loop coupled between the output of the feedback loop and the input of the feedback loop.

Embodiments of the present invention further include a method for use in a feedback loop such as that of Claims 1 and 20, the method including the steps of moving a pole in the loop frequency response using the at least one adjustable pole element yielding a change in the closed loop frequency response (as recited in Claims 13 and 22) and of moving a zero in the loop

frequency response using the at least one adjustable zero element yielding a change in the closed loop frequency response (as further recited in Claim 22).

Based on the amendments to Claims 1 and 20, the Cahill reference clearly does not anticipate these claims because Cahill fails to disclose the topology of the circuits now recited in these claims as a result of the above amendments. Cahill discloses a *radio receiver* in a communication device that includes two variable bandwidth filters. The receiver detects whether a received signal on a desired channel includes undesired interference from an adjacent channel by comparing the received signal strength and the bit error rate (BER). Where the receiver detects interference, it adjusts the bandwidth *of the filters* to attenuate this undesired interference (Abstract; col. 1, lines 8-13; col. 2, lines 6-11 and 39-55). The topology of the receiver is illustrated in figure 1 of Cahill. The receiver includes an amplifier connected to the *input* of the radio receiver to receive a signal transmitted by a transmitter of a different communication device, which does not disclose the limitations recited in Claims 1 and 20 of "a power amplifier coupled to the *output* of the feedback loop in the forward path of the feedback loop".

The receiver of Cahill further comprises the two adjustable filters coupled between the *output* of the amplifier and the output of the receiver, which is a conventional speaker (col. 4, line 13). These filters have nothing at all to do with adjusting a loop bandwidth associated with a forward path and a feedback path of a feedback loop, but each filter instead has its own characteristic bandwidth the can be (as mentioned above) adjusted to attenuate interference. Thus, Cahill does not teach the limitations of "at least one adjustable zero element coupled between the input of the feedback loop and the power amplifier; and at least one adjustable pole element coupled between the input of the feedback loop and the power amplifier; wherein the at least one adjustable zero element and at least one adjustable pole element are operable to change the loop bandwidth of the feedback loop" recited in Claims 1 and 20 nor the limitations of "a mixer in the forward path of the feedback loop coupled between the input of the feedback loop and the power amplifier; and a mixer in the feedback path of the feedback loop coupled between the output of the feedback loop and the input of the feedback loop" further recited in Claim 20.

Based on the above arguments, Applicants submit that Cahill does not anticipate Claims 1, 2, 4-6, 8-9, 11, 18, 19 and 20 as it fails to disclose all of the limitations of these claims. Applicants therefore ask that the Examiner remove the rejections to these claims based on the Cahill reference.

Regarding Claims 7 and 12, Applicants submit that the Examiner has not established a *prima facie* case of obviousness because the combined disclosures of Cahill and Wray fail to teach all of the limitations recited in Claims 7 and 12, and the references teach away from their combination (*See* MPEP §§2143 and 2145). Applicants have already discussed the teachings disclosed in the Cahill reference. Wray discloses an amplifier circuit used in a *transmitter* of a radio having two modes of operation, one that requires an open loop configuration and one that requires a closed loop configuration (col. 1, lines 5-8; col. 3, lines 56-60). The amplifier circuit maintains a constant gain during both modes of operation (col. 3, lines 19-20; col. 3, line 46) by using a "gain adjustment means *external to the control loop* . . . [having] first and second *external gain means* being selected to maintain approximately constant gain between the input and the output of the amplifier during opening and closing the loop" (emphasis added, col. 2, lines 21-27). The preferred embodiment of the amplifier circuit employs Cartesian feedback linearization, which the reference defines as a "linearising technique often *used in designing linear transmitters* . . . [that] is a 'closed loop' negative feedback techniques which sums the baseband feedback signal in its "I" and "Q" formats to the "I" and "Q" input signals prior to amplifying and *up-converting this signal to it's output frequency and power level*" (emphasis added, col. 1, lines 27-33).

Neither the Cahill nor Wray references teach the limitations recited in Claim 1 and included by dependency in Claims 7 and 12 of "at least one adjustable zero element coupled between the input of the feedback loop and the power amplifier; and at least one adjustable pole element coupled between the input of the feedback loop and the power amplifier, wherein the at least one adjustable zero element and at least one adjustable pole element are operable to change the loop bandwidth of the feedback loop". Applicants explained above why the Cahill reference fails to teach these limitations. Wray fails to teach these elements because its includes no elements within the feedback loop to adjust characteristics of the Cartesian feedback loop (such as the loop bandwidth recited in Claim 1 and included by virtue of dependency in Claims 7 and 12). The only elements disclosed in Wray for adjusting a characteristic of the feedback loop is the gain adjustment means, described above, which Wray explicitly states is external to the loop. Wray further explains that "because the gain adjustment is carried out external to the loop, any negative impact on the phase shift or phase stability is reduced or eliminated, and the circuit can be designed with reduced phase margin and greater simplicity" (col. 2, lines 28-31).

With further regard to Claim 7, the Examiner states on page 5 of the office action dated October 20, 2005 that "it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the feedback loop of Cahill to include the feedback loop is a Cartesian feedback loop as taught by Wray". Applicants disagree because Wray teaches away from such a combination. As pointed out above, Wray explicitly states that the Cartesian feedback loop is to be applied within an amplifier circuit of a *radio transmitter* to sum respective "I" and "Q" input and output signals to the amplifier circuit prior to amplifying and up-converting the combined signal to its output frequency and power level. However, Cahill discloses a *radio receiver* circuit that has no need for and cannot use such a Cartesian feedback loop. The "I" and "Q" input signals of the Cahill circuit are not meant to be up-converted to an output frequency and power level but are simply processed and sent to a speaker for a user of the communication device to hear the voice content that was represented by the input signal.

With further regard to Claim 12, the Examiner states on page 6 of the October 20 office action that "it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the adjustable zero element of Cahill to include the following elements: an adjustable first amplifier, a second amplifier, a low pass filter, and a summer taught by Wray". Applicants disagree. As argued above, Cahill does not even disclose an adjustable zero element that can be modified by Wray. Furthermore, Wray does not even disclose a "summer to add the filtered amplified signal and the second amplified signal" as recited in Claim 12. The Examiner calls element 103 of figure 2 such a filter. However, what the Examiner calls the filtered amplified signal (i.e., the output of low pass loop filter 106) and the amplified signal (i.e., the *output* of gain element 20) are not added by summing element 103. Figure 2, in fact, contrarily illustrates the output of summing element 103 being provided as the *input* to gain element 20.

For these reasons, Applicants submit that the combined teachings of Cahill and Wray do not render obvious Claims 7 and 12 and ask that the Examiner remove the rejections to these claims based on these references.

For all of the reasons argued above, neither the teachings of Cahill not the teachings of Wray disclose the limitations recited in Claims 13 and 22 and included by dependency in Claims 14-17 of "moving a pole in the loop frequency response using the at least one adjustable pole element yielding a change in the closed loop frequency response" and further recited in Claim 22

of "moving a zero in the loop frequency response using the at least one adjustable zero element yielding a change in the closed loop frequency response". There is no adjustable zero element or adjustable pole element disclosed in either Cahill or Wray to perform the functionality recited in the methods of Claims 13-17 and 22. For these reasons, Applicants submit that the combined teachings of Cahill and Wray do not render obvious Claims 13-17 and 22 and request that the Examiner accordingly removed the rejections of these claims based on these references.

The Applicants believe that the subject application, as amended, is in condition for allowance. Such action is earnestly solicited by the Applicants.

In the event that the Examiner deems the present application non-allowable, it is requested that the Examiner telephone the Applicants' attorney or agent at the number indicated below so that the prosecution of the present case may be advanced by the clarification of any continuing rejection.

Accordingly, this application is believed to be in proper form for allowance and an early notice of allowance is respectfully requested.

Please charge any fees associated herewith, including extension of time fees, to Deposit Account No. 502117, Motorola, Inc.

Respectfully submitted,

By: _____

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